

Appl. No. 10/734,072
Response to 01/03/2007 Final Office Action
Atty. Dkt. MI40-369

In the Claims:

Claims 1 and 3-18 are from the patent and have not been amended from the patent.

In order to incorporate those corrections made in the Certificate of Correction issued July 16, 2002, please amend Claim 2, at Col. 8, line 20, as follows:

2. A method of forming an integrated circuit within a substrate comprising:
[if] providing a recess in a substrate;
providing substantially an entirety of an antenna within the recess; and
providing an integrated circuit chip and a battery supported by the substrate and in operative electrical connection with the antenna.

19. (Twice Amended) A method of forming a device comprising:
providing a recess within a substrate;
providing at least a portion of an antenna within the recess;
providing an integrated circuit at least partially within the recess and in operative electrical connection with the antenna;
wherein the antenna crosses itself at a bypass, said bypass comprising dielectric material between crossing portions of the antenna; and
wherein the antenna includes a connection between the integrated circuit and a first antenna portion, the first antenna portion extending from at least partially within the recess to outside the recess, a second connection between the integrated circuit and a second antenna portion, the second antenna portion extending from at least partially within the

Appl. No. 10/734,072
Response to 01/03/2007 Final Office Action
Atty. Dkt. M140-369

recess to outside the recess, and a third antenna portion outside of the recess and coupled to the first and second antenna portions.

Claims 20-38 are cancelled.

39. (Thrice Amended) A method comprising:

forming a recess in a plastic substrate, the recess having an approximately planar bottom surface and four sidewall surfaces that slope outward from the bottom surface toward an upper surface of the substrate; and subsequently performing the steps of:

providing a monolithic integrated circuit chip within the recess, the chip comprising RFID circuitry coupled to first and second antenna ports to provide memory and processing functions, the first and second antenna ports configured to be electrically coupled together via an antenna and, subsequent to the forming of the recess:

providing a first conductive layer coupled to the first antenna port of the chip and extending over at least a portion of a first of the sidewall surfaces; and

providing a second conductive layer coupled to the second antenna port of the chip and extending over at least a portion of a second of the sidewall surfaces.

40. (Once Amended) The method of claim 39, wherein providing the first and second conductive layers comprises printing.

Appl. No. 10/734,072
Response to 01/03/2007 Final Office Action
Atty. Dkt. MI40-369

41. (Once Amended) The method of claim 39, further comprising forming a conductive adhesive between the first conductive layer and the first antenna port and forming a conductive adhesive between the second conductive layer and the second antenna port.

42. (Twice Amended) The method of claim 39, further comprising:
providing at least a portion of an antenna over the upper surface of the substrate and coupling the antenna to the first and second conductive layers; and
providing a flexible plastic film over the recess, the chip, and the antenna, the flexible plastic film being bonded to the portion of the antenna.

43. (Twice Amended) The method of claim 39, further comprising:
providing at least a portion of an antenna formed using a first process over the upper surface of the substrate;
coupling the antenna to the first and second conductive layers, the first and second conductive layers having been formed using a second process; and
providing a flexible plastic film over the recess, the chip, and the antenna.

Claims 44-62 are cancelled.

Appl. No. 10/734,072
Response to 01/03/2007 Final Office Action
Atty. Dkt. M140-369

63. (Once Amended) A method comprising:

providing a plastic substrate comprising a plurality of recesses, each of the recesses having a bottom surface and four sidewall surfaces that extend non-perpendicularly from the bottom surface toward an upper surface of the substrate; and subsequently performing the steps of:

disposing a plurality of integrated circuits within the plurality of recesses such that each of the recesses contains an integrated circuit, each of the integrated circuits comprising RFID circuitry coupled to first and second antenna ports to provide memory and processing functions, the first and second antenna ports configured to be electrically coupled together via an antenna; and

providing a plurality of continuous conductive films, each of the continuous conductive films having a first portion and a second portion, the first portion being coupled to respective ones of the integrated circuits disposed within the recesses and the second portion extending above the upper surface of the substrate.

64. The method of claim 63, wherein the substrate comprises a plurality of rows of recesses and a plurality of columns of recesses.

65. The method of claim 63, further comprising covering the plurality of integrated circuits and the plurality of continuous conductive films with an insulating material initially provided as a liquid material that is subsequently cured into a non-liquid material, and wherein each of the continuous conductive films is disposed over at least one respective sidewall surface between the first and second portions.

Appl. No. 10/734,072
Response to 01/03/2007 Final Office Action
Atty. Dkt. MI40-369

66. The method of claim 63, wherein the continuous conductive films comprise printed films.

67. The method of claim 63, wherein the first portion of each of the continuous conductive films is coupled to respective ones of the integrated circuits using a conductive adhesive.

Claims 68-72 are cancelled.

73. (Twice Amended) A method comprising:
forming a recess in a plastic substrate, the recess having a bottom surface and four sidewall surfaces that extend non-perpendicularly from the bottom surface toward an upper surface of the substrate; and subsequently performing the steps of:
providing an antenna portion disposed outside of the recess;
disposing an integrated circuit within the recess, the integrated circuit comprising RFID circuitry coupled to first and second antenna ports to provide memory and processing functions;
disposing a conductive material layer over at least one of the four sidewall surfaces to couple the integrated circuit to the antenna portion outside the recess, wherein the antenna portion is configured to electrically couple the first antenna port to the second antenna port; and
providing a flexible film over the recess, the integrated circuit, and the conductive material layer.

Appl. No. 10/734,072
Response to 01/03/2007 Final Office Action
Atty. Dkt. MI40-369

74. The method of claim 73, wherein depositing the conductive material layer comprises printing a film.

75. The method of claim 73, further comprising coupling the integrated circuit to the conductive material layer using a conductive adhesive.

76. The method of claim 75, wherein the conductive material layer is disposed over the bottom surface at a first end and over the upper surface at a second end.

77. (Once Amended) The method of claim 76, further comprising covering the conductive material layer with an insulating material and bonding the flexible film directly on at least a portion of the insulating material.

78. The method of claim 77, wherein the antenna comprises a material layer that is different from the conductive material layer.

79. (Once Amended) The method of claim 73, further comprising covering the conductive material layer with an insulating material and bonding the flexible film over the insulating material.

80. The method of claim 79, wherein covering the conductive material layer with the insulating material comprises forming the insulating material directly on the conductive material layer and over the upper surface of the substrate.

Appl. No. 10/734,072
Response to 01/03/2007 Final Office Action
Atty. Dkt. M140-369

81. The method of claim 80, wherein covering the conductive material layer with the insulating material includes depositing a liquid material and curing the liquid material to form the insulating material.

82. The method of claim 81, wherein depositing the conductive material layer comprises printing a film.

83. (Once Amended) The method of claim 82, wherein the film is less than about one mil in thickness.

84. (Twice Amended) A method comprising:
providing a plastic substrate comprising a recess, the recess having a bottom surface and sidewall surfaces that extend non-perpendicularly from the bottom surface toward an upper surface of the substrate, each of the sidewall surfaces sloping outward from the bottom surface toward the upper surface;

providing an antenna, at least a portion of which is a first conductive film disposed above the upper surface;

providing an integrated circuit within the recess, the integrated circuit comprising RFID circuitry coupled to first and second antenna ports to provide memory and processing functions;

providing a second conductive film, separate from the first conductive film, having a first region coupled to the integrated circuit and a second region coupled to the portion of the antenna; and

Appl. No. 10/734,072
Response to 01/03/2007 Final Office Action
Atty. Dkt. MI40-369

disposing a flexible film above the recess, the antenna, the integrated circuit, and the second conductive film, and electrically coupling the first and second antenna ports together via the antenna.

85. The method of claim 84, wherein the second conductive film comprises a printed film.

86. The method of claim 84, wherein the first region of the second conductive film is disposed above the bottom surface.

87. The method of claim 84, wherein the second conductive film is disposed above at least one of the sidewall surfaces between the first and second regions.

88. The method of claim 84, further comprising bonding a conductive adhesive to the integrated circuit and to the first region of the first conductive film.

89. The method of claim 84, wherein at least one of the sidewall surfaces slopes in at least a generally linear manner from the bottom surface.

90. (Twice Amended) The method of claim 89, further comprising covering the second conductive film with an insulating material and disposing the flexible film over the insulating material.

Appl. No. 10/734,072
Response to 01/03/2007 Final Office Action
Atty. Dkt. M140-369

91. (Twice Amended) The method of claim 84, further comprising covering the second conductive film with an insulating material and disposing the flexible film over the insulating material.

92. (Twice Amended) A method comprising:
providing a plastic substrate comprising a plurality of recesses, each of the recesses having a bottom surface and four sidewall surfaces that extend non-perpendicularly from the bottom surface toward an upper surface of the substrate; and subsequently performing the steps of:

disposing a plurality of integrated circuits within the plurality of recesses such that each of the recesses contains no more than a single respective integrated circuit, each respective integrated circuit comprising respective RFID circuitry to provide memory and processing functions, the respective RFID circuitry coupled to respective first and second antenna ports configured to be coupled together via a respective antenna; and

forming a plurality of continuous conductive films, each of the continuous conductive films having a first portion and a second portion, the first portion being coupled to respective ones of the integrated circuits disposed within the recesses and the second portion extending above the upper surface of the substrate.

93. The method of claim 92, wherein the substrate comprises a plurality of rows of recesses and a plurality of columns of recesses, and further comprising dividing the substrate into a plurality of singular substrates after forming the plurality of conductive films, each of the singular substrates comprising a single recess.

Appl. No. 10/734,072
Response to 01/03/2007 Final Office Action
Atty. Dkt. MI40-369

94. The method of claim 93, wherein each of the continuous conductive films is disposed above at least one respective sidewall surface between the first and second portions, and each of the singular substrates comprises two continuous conductive films.

95. The method of claim 94, wherein forming the plurality of continuous conductive films comprises printing a conductive material.

96. The method of claim 95, wherein the first portion of each of the continuous conductive films is coupled to respective ones of the integrated circuits using a conductive adhesive.

97. (Thrice Amended) A method comprising:
providing a substrate comprising a recess, the recess having a bottom surface and four sidewall surfaces that extend non-perpendicularly from the bottom surface toward an upper surface of the substrate, each of the sidewall surfaces sloping outward from the bottom surface toward the upper surface;

providing an antenna, at least a portion of which is a first conductive material disposed above the upper surface;

providing an integrated circuit within the recess, the integrated circuit comprising RFID circuitry to provide memory and processing functions and coupled to first and second antenna ports of the integrated circuit;

providing a second conductive material, separate from the first conductive material, having a first region coupled to the integrated circuit and disposed above the bottom surface, having a second region coupled to the portion of the antenna and disposed above

Appl. No. 10/734,072
Response to 01/03/2007 Final Office Action
Atty. Dkt. MI40-369

the upper surface, and having a third region between the first and second regions and disposed above one of the sidewall surfaces; and

disposing a flexible film over the recess, the integrated circuit, the antenna, and the second conductive material, wherein the first and second antenna ports are electrically coupled together via the antenna.

98. (Once Amended) The method of claim 97, further comprising bonding a conductive adhesive to the integrated circuit and to the first region of the second conductive material.

99. (Once Amended) The method of claim 98, wherein providing the second conductive material comprises printing the second conductive material.

100. (Twice Amended) The method of claim 99, further comprising covering the second conductive material with an insulating material and disposing the flexible film over the insulating material.

101. The method of claim 100 wherein at least one of the sidewall surfaces slopes in at least a generally linear manner from the bottom surface.